EMCal Single Particle Performance

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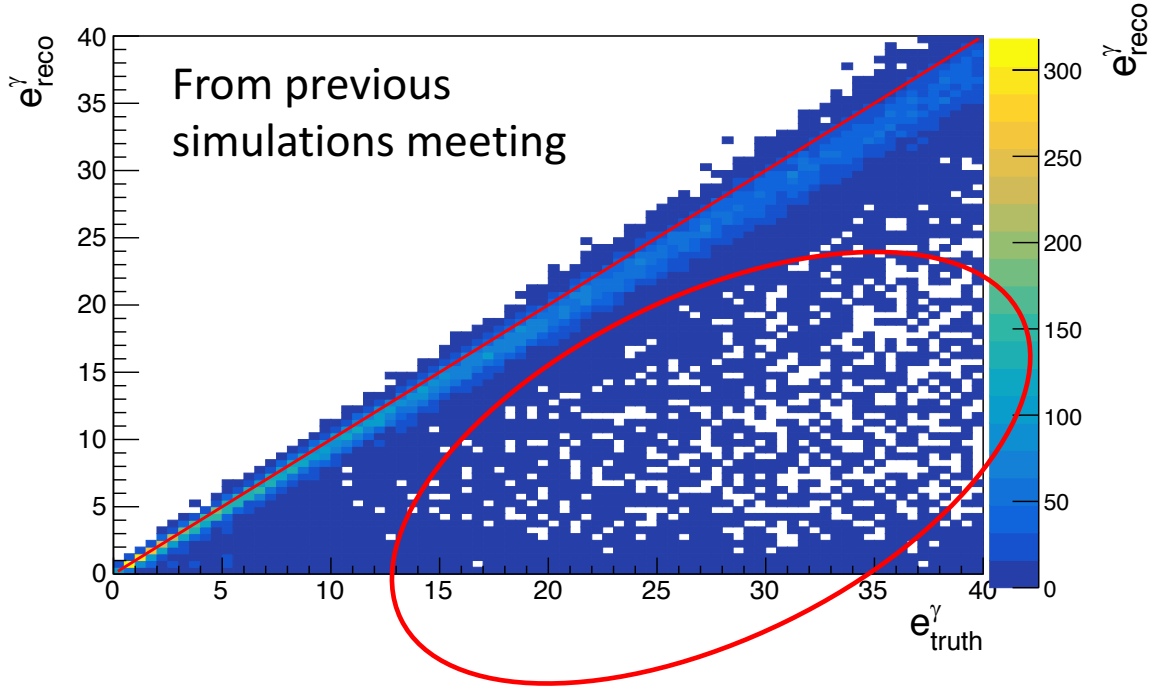
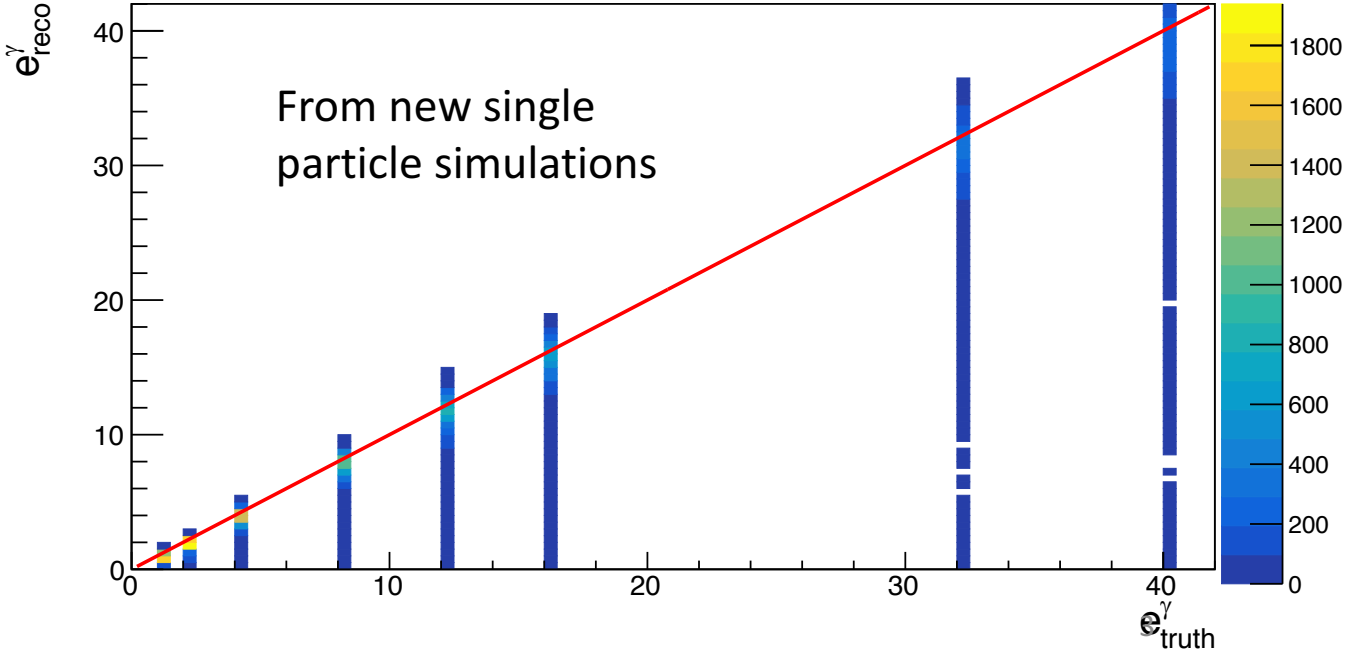
EMCal Response

- Using the produced G4 hits of γ and $e^{\pm}$
- Check energy resolution and response of EMCal after Jin implemented major changes last week with module tilting, etc.

Reminder: Low Energy Reconstructed “grass”

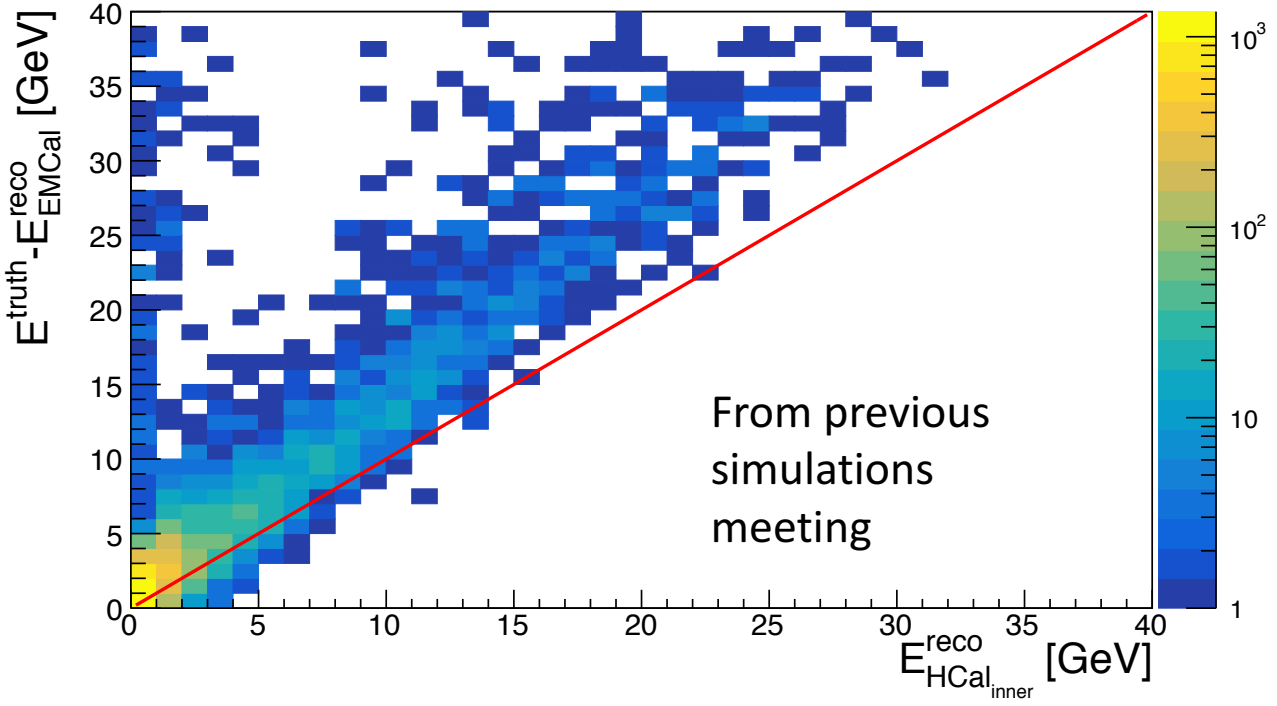
- Abinash at Ohio University and I saw significant proportion of low energy reconstructed photons
- Still see some nonzero amount of low energy grass reconstructed for high energy photons



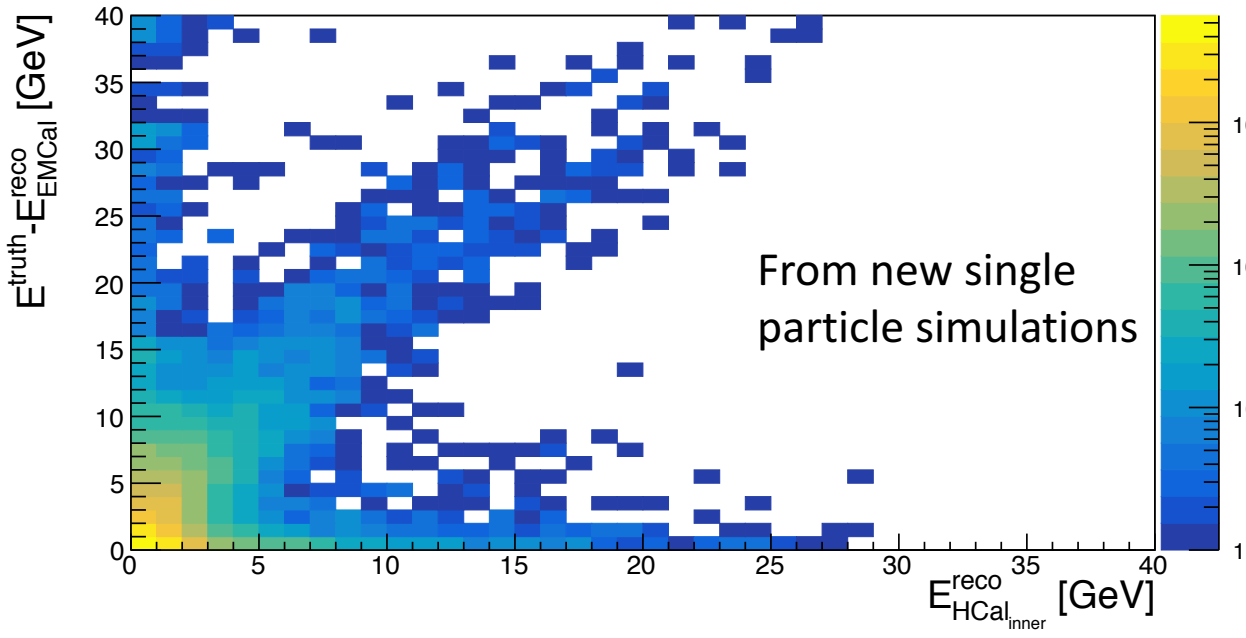


Correlations with inner HCal

- Saw correlation with energy deposited into inner HCal last time due to tunneling

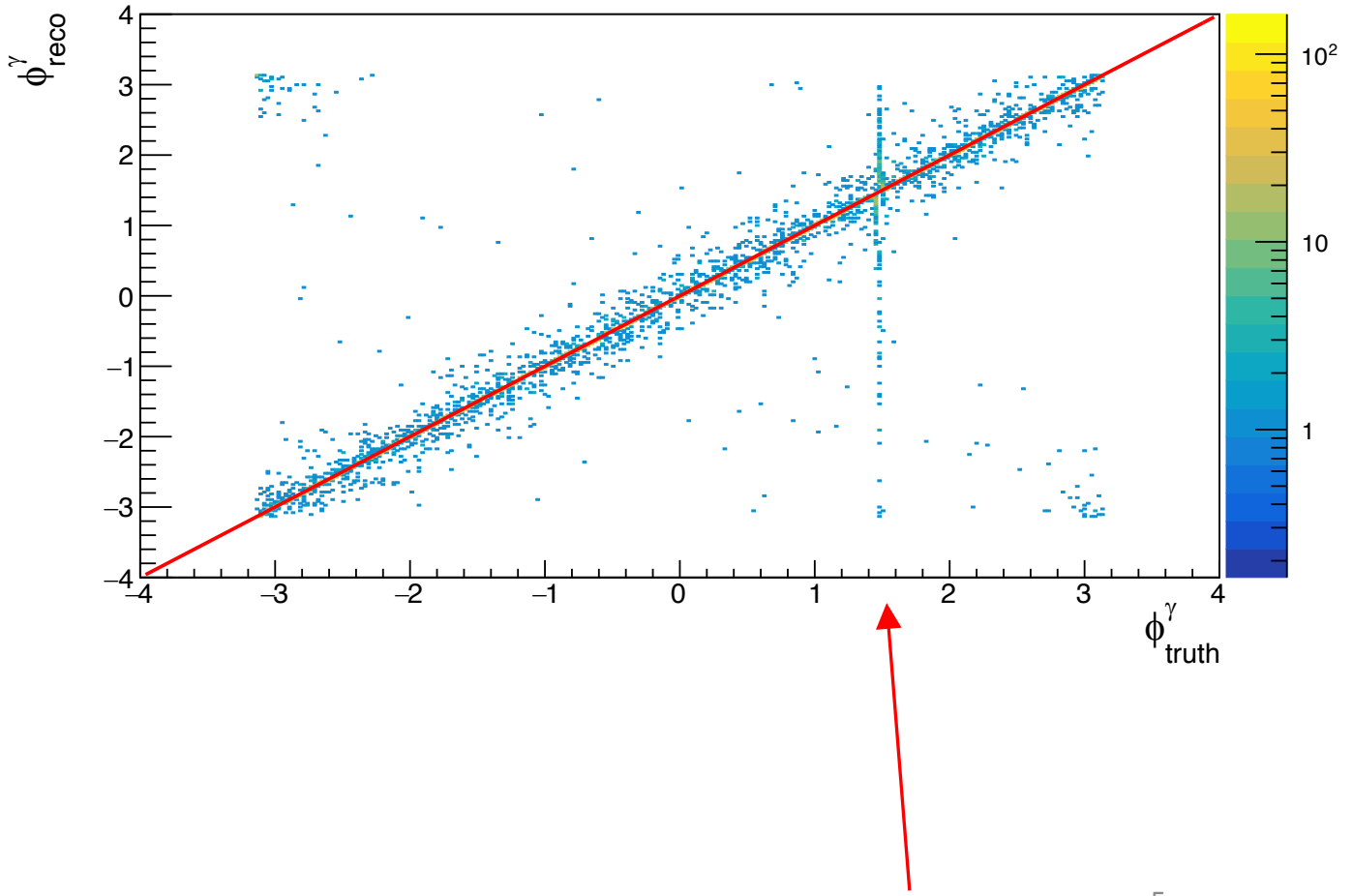


- Still see similar correlation. Additionally see photons that are well reconstructed in the EMCal deposit energy into the HCal. Shower leakage?



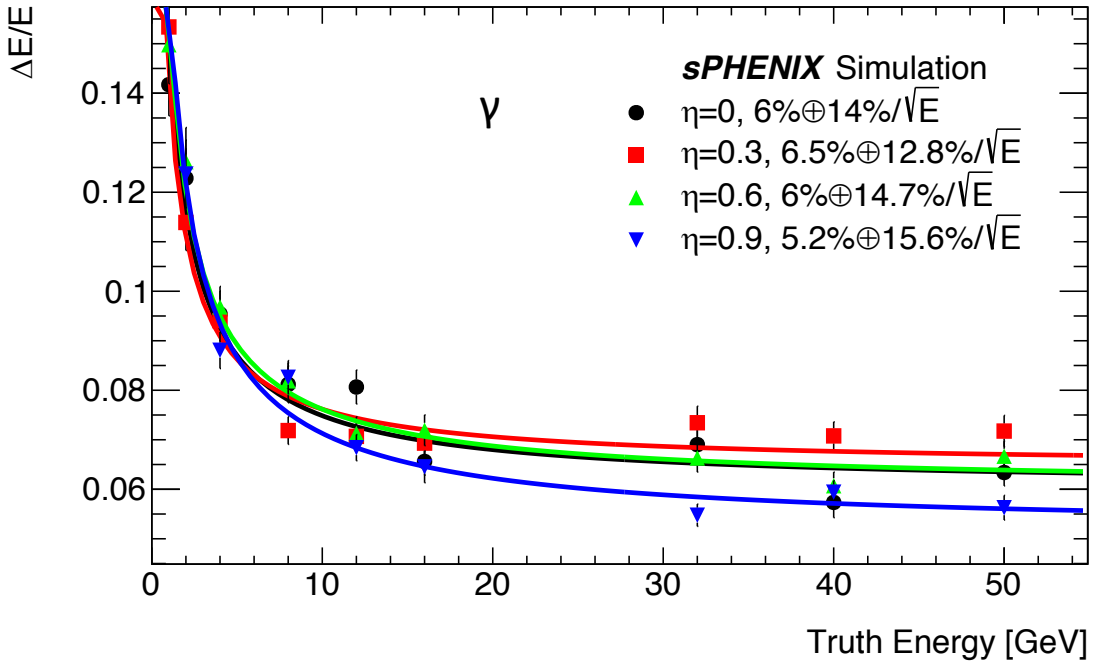
Azimuthal angle

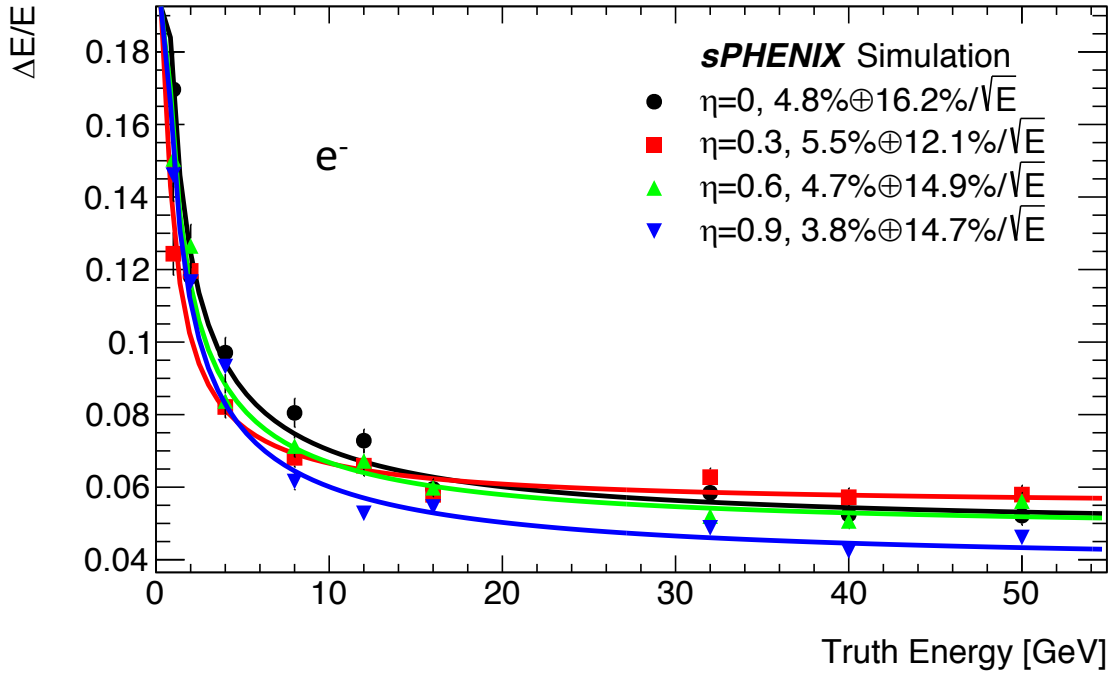
- Still see this azimuthal structure at $\phi \sim \pi/2$
- Probably a wrap around artifact – we should look into it and check where this might be happening. Easy fix
- Note: I don't alter the ϕ at all in my analysis code – taken straight from the RawClusterContainer node

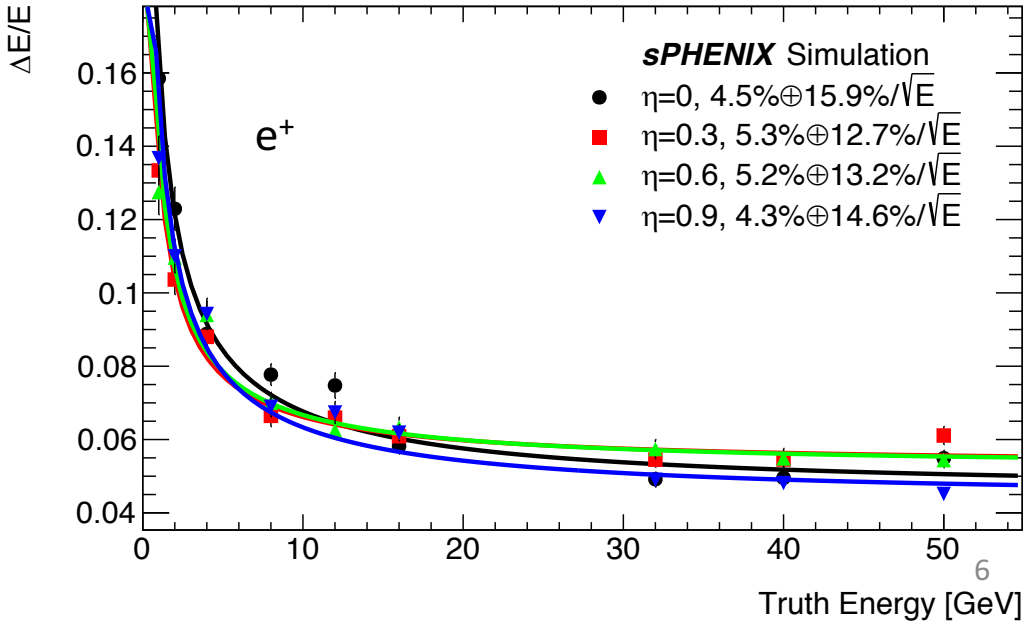


Energy Resolution

- Energy resolution determined for γ and $e^{\pm}$ in their respective η bins, shown here







To-Do

- New single particle simulations appear to be reasonable
- Still see similar issues in regards to low energy grass and tunneling to before module tilting
- Energy resolutions have reasonable stochastic term and are roughly the same across η
- To-Do
  - Work on position dependent energy recalibration to hopefully reduce constant term. Test beam results show constant term should be lower